

FLITECAM

First Light Infrared Test Experiment CAMera

FLITECAM is a facility class multi-purpose near-infrared camera operating from 1-5.5 μm for SOFIA, the Stratospheric Observatory for Infrared Astronomy.

FLITECAM is designed to provide a tool for testing the image quality of the SOFIA telescope, including detection of small (~ 3 mm) black spots on the primary mirror by an optional pupil-viewing mode. In its spectroscopic mode it can also be used to study aircraft exhaust plumes, and provide a calibration of the SOFIA water vapor monitor.

The imaging detector in FLITECAM is an ALADDIN indium antimonide (InSb) array of 1024×1024 pixels. Imaging from 1 - 5.5 μm includes standard J, H, K, L', L, M filters and a selection of special narrow band filters. The performance of the camera is expected to be seeing-limited from 1 - 3 μm and diffraction-limited from about 3 - 5.5 μm . With the addition of grisms, FLITECAM will perform low resolution spectroscopy with typical resolving powers (2 pixels) of $R = 2000$.

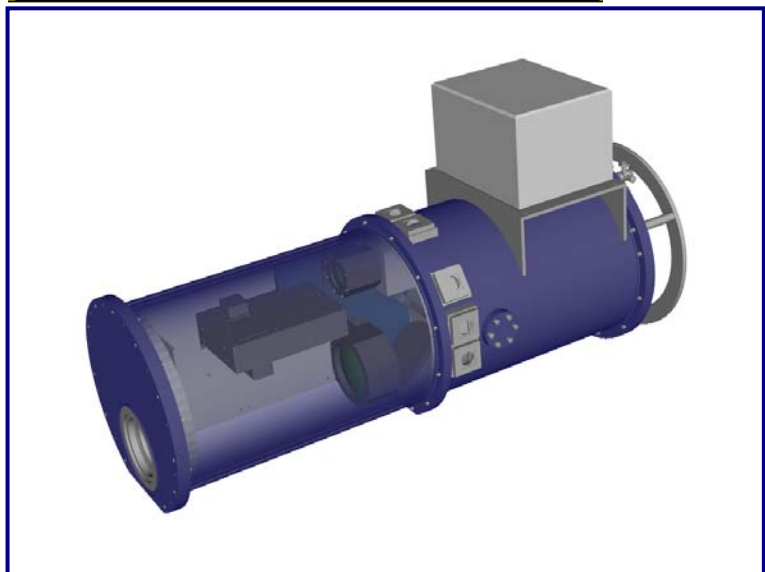
A special feature of FLITECAM is that it can be co-mounted for simultaneous operation with HIPO (High-speed Imaging Photometer for Occultations), which will enable both infrared and optical photometry of occultation events. In addition to its role as a test camera, FLITECAM will also produce images for public outreach and for science.

Science

FLITECAM is capable of a wide range of scientific projects. In imaging mode, its large field of view will enable surveys of stellar populations in star-forming regions within the Galaxy and in nearby galaxies. In spectroscopic mode, the instrument will be able to, for example, distinguish solid CO ice features from gas-phase, and study atomic and rotational-vibrational molecular lines that are obscured from the ground, including Pa α (1.88 μm), Br β (2.63 μm), C₂ (1.4 and 1.8 μm), and C₂H₂ (2.0 and 2.6 μm).



FLITECAM's field of view occupies the 8 arcminute diameter field of the telescope. The camera's field of view is depicted superimposed on an infrared image of the Orion Nebula, obtained by the 2 Micron All Sky Survey. FLITECAM will image this region at longer wavelengths with as much detail. Longer wavelengths are more easily studied by SOFIA than by ground based telescopes.



FLITECAM is a cylindrical construction with refractive optics to re-image the SOFIA focal plane onto the infrared detector. The optics are located in the forward section (shown translucent) with liquid helium/nitrogen tanks in the rear.

Specifications

Wavelength Range:	1 - 5.5 μm for imaging; L band for pupil viewing
Quantum Efficiency:	~80%
Detector:	Raytheon ALADDIN II 1024x1024 InSb array
Spectroscopy:	1 - 5.5 μm possible with gratings
Spectral Resolution:	R = 1000 - 2000
Imaging Channels:	J, H, K, L', L, M, plus narrow band filters
Maximum Frame Rate:	4 read-outs per second for full frame
Highest Time Resolution:	~1.6 ms per frame (32x32 pixel sub-frame)
Read Noise:	~ 40 electrons rms (single CDS)
Field of View on SOFIA:	8' diameter
Pixel scale on SOFIA:	0.47" x 0.47" per pixel
Optical System:	Triplet collimator; F/5 imager; pupil-viewing lenses Dual 10-position filter wheel
Data Format:	FITS files

The FLITECAM Team

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For more information, visit <http://www.sofia.usra.edu/observatory/instruments>